



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/678,611  | 10/04/2000  | Kohji Sakai          | 198004US2           | 7156             |
| 22850   | 7590        | 03/29/2006           | EXAMINER            |                  |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      | PHAM, HAI CHI       |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2861                |                  |

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/678,611

Applicant(s)

SAKAI ET AL.

Examiner

Hai C. Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## FINAL REJECTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-9, 11-13, 15, 19, 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki et al. (U.S. 6,347,004).

Suzuki et al. discloses in Figs. 1A-1B an optical scanning apparatus condensing a beam deflected by an optical deflector (polygon mirror 20) so as to form a beam spot on a surface to be scanned (scanned surface 26), comprising two lenses (first and second scanning lenses 22 and 24), wherein:

- a lens (first scanning lens 22) on the side of the optical deflector has a negative refracting power in sub-scanning direction (see the listed sub-scanning radius Rs

Art Unit: 2861

of curvature on the surfaces of the first lens 22, e.g., first and second surfaces, at col. 14, lines 1-10),

- a lens (second scanning lens 24) on the side surface to be scanned has a positive refracting power in the sub-scanning direction (see the listed sub-scanning radius  $R_s$  of curvature on the surfaces of the second lens 24, e.g., third surface, at col. 14, lines 1-10),
- at least one lens surface of the lens surfaces of the two lenses is such that a shape in the sub-scanning section is a non-arc shape (the exit surface of lens 24, e.g., surface #4, having a non-arc shape) (Fig. 1B), and said at least one lens surface has a non-coaxial surface (the exit surface of lens 24 or surface #4 having the non-arc shape in the sub-scanning cross section and its change of the main scanning direction being defined by equations (E) and (F) shown at col. 12, which denote the characteristic a non-coaxial surface) (col. 12, lines 53-67) (col. 14, lines 25-32),
- two lens surfaces such that a curvature in a sub-scanning section varies in the main scanning direction are formed in different lenses (the surfaces of the first lens 22 or surfaces #1 and 2 are defined by equation (A), which denotes the shape of the lens being asymmetric in the main scanning direction while the incident surface of the second lens 24 or surface #3 has a shape such that the curvature in the sub-scanning section changes along the main scanning direction) (col. 14, lines 17-23),

Art Unit: 2861

- at least one surface of said at least two lens surfaces is such that change in the main scanning direction of a curvature in a sub-scanning section thereof is asymmetrical (the surfaces of the second lens 24 have the shape defined by equation (C), which denotes the curvature radius in the sub-scanning cross section becomes asymmetric in the main scanning direction) (col. 12, lines 44-52) (col. 14, lines 19-32),
- said optical system is such that a lateral magnification ( $\beta_0$ ) in the sub-scanning direction at a central height and a lateral magnification ( $\beta_h$ ) in the sub-scanning at any image height satisfy the following condition:

$$0.93 < |\beta_h / \beta_0| < 1.07 \quad (\text{col. 6, lines 42-43})$$

- The surface such that a shape in a sub-scanning direction is a non-arc shape is a sub-non-arc surface such that the non-arc shape changes according to the position in main scanning direction of the sub-scanning direction (the exit surface of the second lens 24 is a sub non-circular arc surface) (col. 11, lines 24-26),
- Said lens on the side of optical deflector (first imaging lens 22) has a positive refracting power in main scanning direction (col. 14, lines 1-10),
- A lateral magnification ( $\beta_0$ ) on an optical axis in the sub-scanning direction satisfies the following condition:  $0.2 < |\beta_0| < 1.5$  (col. 6, lines 18-19), which amply satisfies the condition as claimed in claim 4,
- A shape of the sub-non-arc surface in a main scanning section is a non-arc shape (the exit surface of the second lens 24 or surface #4 has the shape

defined by equation (B), which denotes the a shape that becomes asymmetric in the main scanning direction) (col. 11, lines 55-62) (col. 14, lines 25-32),

- said optical system comprises an anamorphic optical system having a function of making a position on or the proximity of a defection reflective surface of the optical deflector and a position on the surface to be scanned have a geometric-optical conjugate relationship with regard to the sub-scanning direction (col. 13, lines 29-37),
- in each of all the four lens surfaces of said two lenses, curvatures in the main and sub-scanning directions are different from one another (the optical system being anamorphic) (Fig. 1B),
- said optical system has an imaging capability such that, when a spot diameter of a beam spot on the surface to be scanned is defined by  $1/e^2$  intensity in line spread function of light intensity distribution of the beam spot, the spot diameter in each of the main and sub-scanning directions is equal to or smaller than  $50\text{ }\mu\text{m}$  in an effective writing width (col. 5, lines 30-37),
- In each of the four lens surfaces of the two lenses, the curvatures in the main and sub-scanning directions are different from one another (the imaging lenses 22 and 24 are anamorphic lenses) (col. 13, lines 29-31),
- A non-arc amount, which is an amount of difference of the non-arc shape in the sub-scanning section of the sub-non-arc from an arc, changes asymmetrically in the main scanning direction (e.g., the sub non-arc shape of the exit surface of the second lens 24 is defined by equation (C)) (col. 12, lines 44-52),

Art Unit: 2861

- An effective writing width  $W$  and a width  $F_s$  of sub-scanning curvature of field in the effective writing width satisfies the following condition:

$$F_s / W < 0.005 \quad (\text{col. 8, lines 26-27})$$

- Said two lenses have at least two lens surfaces each of which is such that change in the main scanning direction of a curvature in a sub-scanning section is asymmetrical (e.g., at least surfaces #2 and 4), and at least two lens surfaces of said at least two lens surfaces have an air separation therebetween (the two special surfaces, e.g., surfaces #2 and 4, being on two different lenses and thus there exists an air separation in between),
- The optical scanning device being a single beam system,
- An electrostatic latent image being formed on the photosensitive surface (26) of the photoconductive body and being [inherently] visualized into a toner image.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 14, 16-18, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of Ota et al. (U.S. 5,305,022).

Suzuki et al. discloses all the basic limitations of the claimed invention except for the plurality of light sources, which are provided as a laser array with the interval of the light emitting points equal to or larger than 10  $\mu\text{m}$ .

Ota et al. discloses a multi-beam scanning recording apparatus having a semiconductor laser array for simultaneously scanning the surface of the photosensitive drum to form an electrostatic latent image, which is developed to become a visible toner image, wherein the interval between the light emitting sources in the semiconductor laser array can be set at least at 10  $\mu\text{m}$  (col. 1, lines 36-48).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a semiconductor laser array as taught by Ota et al. in the device of Suzuki et al. for the purpose of providing a high-speed optical scanning device.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-9 and 11-22 have been considered but are moot in view of the new grounds of rejection.

### ***Conclusion***

6. Applicant's amendment, which changed the scope of each of the base claims, necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM  
PRIMARY EXAMINER

March 25, 2006